

## TEACHING MATHEMATICS IN THE ELEMENTARY SCHOOL EDMS 543 - Fall 2002

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The mission of the College of Education Community is to collaboratively transform public education by preparing thoughtful educators and advancing professional practices. We are committed to diversity, educational equity, and social justice, exemplified through reflective teaching, life-long learning, innovative research, and on-going service. Our practices demonstrate a commitment to student-centered education, diversity, collaboration, professionalism, and shared governance.

### REQUIRED MATERIALS:

- California Department of Education (2000). Mathematics Content Standards for California Public Schools, Kindergarten Through Grade Twelve. Sacramento, CA: author. This document can be found on the WWW at: <http://www.cde.ca.gov/standards/math/> (I highly encourage students to purchase this publication).
- National Council of Teachers of Mathematics (2000). Principles and standards for school mathematics. Reston, VA: author. Can be found on the WWW at: <http://standards.nctm.org/>
- Star Test Blueprints for Standards Items (<http://www.cde.ca.gov/statetests/star/s2blueprt.html>)
- Van de Walle, John A. (2001). Elementary and middle school mathematics: Teaching developmentally (4<sup>th</sup> ed.). New York: Addison Wesley Longman

### COURSE DESCRIPTION:

Learning to teach mathematics well is difficult and, therefore, you must expect that this course will only begin your education in learning how to teach mathematics. This course is but one stage in what I hope will be a continuing evolution of you as a mathematics teacher. The focus of this course will be on (1) developing an understanding of the current practices in mathematics, (2) learning to teach content specific concepts using effective and appropriate strategies, and (3) practicing how to teach for mathematical understanding. Enfolded into this course will be curriculum development, developing an understanding of children's content specific thinking, creating a classroom environment that promotes the investigation and growth of mathematical ideas, and developing strategies to ensure the success of all students in multi-cultural settings.

#### Standards Alignment:

The course objectives, assignments, and assessments have been aligned with the CTC standards for Multiple Subjects Credential. The following standards are a primary emphasis in this course:

- Standard 3: Relationship between Theory and Practice
- Standard 4: Pedagogical Thought and Reflective Practice
- Standard 5: Equity, Diversity and Access to the Core Curriculum for All Children
- Standard 8A(a): Pedagogical Preparation for Subject-Specific Content Instruction by MS Candidates (Mathematics)

#### Teacher Performance Expectation (TPE) Competencies:

This course is designed to help teachers seeking the Multiple Subjects Credential to develop the skills, knowledge, and attitudes necessary to assist schools and district in implementing an effective program for all students. The successful candidate will be able to merge theory and practice in order to realize a comprehensive and extensive educational program for all students. The following TPE's are addressed in this course:

### Primary Emphasis:

- TPE 1a-Subject Specific Pedagogical Skills for MS Teaching (Mathematics)
- TPE 2-Monitoring Student Learning During Instruction
- TPE 3-Interpretation and Use of Assessments
- TPE 4-Making Content Accessible
- TPE 6a-Developmentally Appropriate Practices in Grades K-3
- TPE 6b-Developmentally Appropriate Practices in Grades 4-8
- TPE 8-Learning About Students

### Secondary Emphasis:

- TPE 5-Student Engagement
- TPE 6d-Developmentally Appropriate Practices for Special Education
- TPE 7-Teaching English Learners
- TPE 9-Instructional Planning
- TPE 10-Instructional Time
- TPE 11-Social Environment
- TPE 13-Professional Growth

### **KEY ASSIGNMENTS:**

Reading Reflections (21%) - Each week students will write a "meaningful" one page reflection on the articles assigned to be read for that week. These reflections should clearly articulate your thoughts **on the articles** and discuss how you might **specifically apply** what you learned from the articles as a teacher in the classroom.

Student Interviews (24%) - You and one of your classmates will conduct a series of four different student interviews based on questions provided in class. For each interview, you will pose mathematical problems to any one student at a predetermined grade level. The purpose is to get you to begin thinking about students' mathematical understanding, to learn how to effectively pose questions and interpret the meaning of students' answers, and to provide you with an opportunity to interact with students.

Mathematical Resources & Lesson (35%)– Working in small groups, your team will first compile resources on a predetermined mathematical topic (20%) and then design a lesson that you will present in an elementary class (or ours as if we were your students) (15%). The purpose of this activity is to help you learn how to design effective mathematical activities, to provide you with an opportunity to begin compiling mathematical resources, and to provide an opportunity for you to practice teaching mathematics.

Curriculum Assignment (20%)– Students will review the mathematics curriculum currently being used in their classroom (e.g., a textbook) at one grade level and write a short paper that investigates the curriculum alignment with the CA Content Standards and current high stakes assessments. Students will also provide their general thoughts and concerns related to the curriculum (e.g., how the curriculum might need to be altered to make strong connections between mathematical concepts and procedures).

**GRADING SCALE:**

Grades will be based on the following grading scale:

- A.....90 -100%
- B.....80 - 89%
- C.....70 - 79%
- D.....60 - 69%
- F.....Below 60%

**AUTHORIZATION TO TEACH ENGLISH LEARNERS:**

This credential program has been specifically designed to prepare teachers for the diversity of languages often encountered in California public school classrooms. The authorization to teach English learners is met through the infusion of content and experiences within the credential program, as well as additional coursework. Students successfully completing this program receive a credential with authorization to teach English learners.

**STUDENTS WITH DISABILITIES REQUIRING REASONABLE ACCOMMODATIONS:**

Students are approved for services through the Disabled Student Services Office (DSS). This office is located in Craven Hall 5205, and can be contacted by phone at (760) 750-4905, or TTY (760) 750-4909. Students authorized by DSS to receive reasonable accommodations should meet with their instructor during office hours or, in order to ensure confidentiality, in a more private setting.

**ATTENDANCE POLICY:**

The attendance policy of the College of Education: Due to the dynamic and interactive nature of course in the COE, all students are expected to attend all classes and participate actively. At a minimum, students must attend more than 80% of class time, or s/he may not receive a passing grade for the course at the discretion of the instructor. If you miss two class sessions or are late (or leave early) more than three sessions, you cannot receive a grade of "A". If you miss three class sessions, your highest possible grade is a "C+". Should you have extenuating circumstances, contact the instructor as soon as possible. Please discuss with me any extenuating circumstances that will cause you to miss class prior to your absence. Attendance will be taken at each class session. Furthermore, grades on assignments turned in late will be lowered unless **prior arrangements** have been made with the instructor.

**PLAGIARISM AND CHEATING:**

Please be sure to read and understand the university policy on plagiarism and cheating as it will be strictly enforced. Academic dishonesty will not be tolerated and will result in a failing grade for this course and will be reported to the University.

**CROSSCULTURAL, LANGUAGE, AND ACADEMIC DEVELOPMENT (CLAD) COMPETENCIES**

<b>TEST 1: LANGUAGE STRUCTURE AND FIRST- AND SECOND-LANGUAGE DEVELOPMENT</b>	<b>TEST 2: METHODOLOGY OF BILINGUAL, ENGLISH LANGUAGE DEVELOPMENT, AND CONTENT INSTRUCTION</b>	<b>TEST 3: CULTURE AND CULTURAL DIVERSITY</b>
<b>I. Language Structure and Use: Universals and Differences (including the structure of English)</b>	<b>I. Theories and Methods of Bilingual Education</b>	<b>I. The Nature of Culture</b>
A. The sound systems of language (phonology) *	A. Foundations	A. Definitions of culture
B. Word formation (morphology) *	B. Organizational models: What works for whom?	B. Perceptions of culture
C. Syntax *	C. Instructional strategies *	C. Intragroup differences (e.g., ethnicity, race, generations, and micro-cultures)
D. Word meaning (semantics) *	<b>II. Theories and Methods for Instruction In and Through English</b>	D. Physical geography and its effects on culture
E. Language in context *	A. Teacher delivery for <u>both</u> English language development <u>and</u> content instruction *	E. Cultural congruence
F. Written discourse *	B. Approaches with a focus on English language development *	<b>II. Manifestations of Culture: Learning About Students</b>
G. Oral discourse *	C. Approaches with a focus on content area instruction (specially designed academic instruction delivered in English) *	A.What teachers should learn about their students *
H. Nonverbal communication *	D. Working with paraprofessionals *	B.How teachers can learn about their students *
<b>II. Theories and Factors in First- and Second-Language Development</b>	<b>III. Language and Content Area Assessment</b>	C.How teachers can use what they learn about their students (culturally responsive pedagogy)*
A. Historical and current theories and models of language analysis that have implications for second-language development and pedagogy	A. Purpose	<b>III. Cultural Contact</b>
B. Psychological factors affecting first- and second-language development	B. Methods *	A. Concepts of cultural contact
C. Socio-cultural factors affecting first- and second-language development	C. State mandates	B. Stages of individual cultural contact
D. Pedagogical factors affecting first- and second-language development *	D. Limitations of assessment *	C. The dynamics of prejudice
E. Political factors affecting first- and second-language development	E. Technical concepts *	D. Strategies for conflict resolution

<b>Date</b>	<b>Session Number and Topic</b>	<b>Assignment to be Completed BEFORE Class Session</b>
<u>Wed</u> 9/4/02	1. Introduction to Mathematics Education	Van de Walle ch. 2
<u>Fri</u> 9/6/02	2. Problem Solving	Van de Walle ch. 4; Choate ch. 11
<u>Wed</u> 9/11/02	3. Developing Mathematical Understanding	Van de Walle ch. 3
<u>Fri</u> 9/13/02	4. Standards	CA Content Standards/NCTM Assignment
<u>Wed</u> 9/18/02	5. Lesson Study & Working Groups	Assigned Readings
<u>Fri</u> 9/20/02	6. Instructional Practices	Van de Walle ch. 22, 23
<u>Wed</u> 9/25/02	7. Assessment & Conducting Student Interviews	Van de Walle ch. 5; Assigned Article(s)
<u>Fri</u> 9/27/02	8. Technology	Van de Walle ch. 24
<u>Wed</u> 10/2/02	9. Addition and Subtraction	Van de Walle ch. 7, 8, 10; Choate ch. 10 *Student Interview #1 Due Today
<u>Fri</u> 10/4/02	10. Multiplication and Division	(Reading integrated with Session 9) *Mult/Div Interview Due (option 2)
<u>Wed</u> 10/9/02	11. Number Concepts	Van de Walle ch. 9, 11, 21 *Number Concepts Interview Due (option 2)
<u>Fri</u> 10/11/02	12. Fractions, Decimals, Percents, Ratio & Proportion	Van de Walle ch. 12, 13, 14, 15 *Fractions Interview Due (option 3)
<u>Wed</u> 10/16/02	13. Algebraic Thinking	Van de Walle ch. 19, 20 *Algebra Interview Due (option 3)
<u>Fri</u> 10/18/02	14. Measurement & Geometry	Van de Walle ch. 16, 17 *Meas/Geo Interview Due (option 4)
<u>Wed</u> 10/23/02	15. Data Analysis & Probability	Van de Walle ch. 18 *Data Anal/Prob Interview Due (option 4)
<u>Fri</u> 10/25/02	16. Wrap-up	Bring Questions to Ask *Curriculum Assignment Due Today